UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,210	10/22/2001	Min-Goo Kim	678-762 (P9997)	4975

28249 7590 01/22/2007

DILWORTH & BARRESE, LLP
333 EARLE OVINGTON BLVD.
SUITE 702
UNIONDALE, NY 11553

EXAMINER	
VLAHOS, SOPHIA	
ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/986,210	KIM ET AL.	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-10, 17-19* is/are allowed.

6)☒ Claim(s) *1-3,5,6,11,12,14 and 15* is/are rejected.

7)☒ Claim(s) *4, 7,13, 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments, see pages 7-8 paragraphs dealing with the rejection of claims 5,6,8,9,11,12,14,15 ,17 and 18 (filed 9/21/2006), with respect to the rejection(s) of the aforementioned claims have been fully considered and are persuasive. Therefore, proper rejections of claims 5, 6, 8, 9, 11, 12, 14, 15 ,17 and 18 are presented below.

Applicant's arguments with respect to the objection of the drawings have been considered and are persuasive. The objection to the drawings is withdrawn.

The amendment of claims 2 and 6 (in the claims received on 9/21/2006) is sufficient to overcome the objection of claims 2 and 6. The objection to claims 2 and 6 is withdrawn.

Applicant's arguments (page 9 of "Remarks" paragraph 5) with respect to the difference between "pruning" and "puncturing" the broadest reasonable interpretation is given to the term "pruning" and therefore "pruning" is interpreted as deleting. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Objections

2. Claim 1-19 are objected to because of the following informalities: Claims 1, 5, 8, 11, 14, 17 recite: "...determining a minimum data rate..." this appears to be a typo, since the specification mentions determining a minimum code rate (see lines 12-24 of page 45, where the function of the controller is explained) and not a minimum data rate. Also Fig. 24, and 25 show the controller outputting a minimum code rate not a minimum data rate recited in the claims.

Claims 2-4, 6,-7, 9-10, 12-13, 15-16, 18-19 are also objected under the same rationale since they contain the limitations of claims 1, 5, 8, 11, 14, 17 respectively.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Banister (U.S. 6,876,641).

With respect to claim 1, Banister discloses: determining a minimum data

rate by which the number of modulation symbols of the sub-code generated by a predetermined modulation method is equal to or greater than a number of transmittable modulation symbols for the time period (Fig. 1, element 20, "Rate Matching Symbol Decimation", see column 4, lines 17-22, the rate matching process determines the data rate that provides a number of symbols equal to the allowed number of symbols, i.e. the minimum data rate that results into a number of symbols that fit in the frame, where (encoded) symbols are generated from a modulation (interpreted as a variation of a property of an electrical signal) using either the optional inner coder or the outer coders); pruning part of the modulation symbols of the sub-code so that the number of the modulation symbols of the sub-code is equal to the number of transmittable modulation symbols for the time period if the number of modulation symbols of the sub-code is greater than the number of transmittable modulation symbols for the time period (see column 4, lines column 4, lines 17-20, pruning is interpreted as "removing" i.e. delete the symbols that do not fit in the frame (and clearly a frame corresponds to a time period)).

With respect to claim 2, all of the limitations of claim 2, are analyzed above in claim 1, and Banister discloses: wherein symbol pruning is performed on a second half of the modulation symbols of the sub-code (see Fig. 2, 2nd sequence of symbols, showing symbols to be deleted ("X") and see that the pruning takes place on a second half of the modulation symbols, column 4, lines 35-54 details with respect to the pruning distance).

With respect to claim 3, all of the limitations of claim 3, are analyzed above in claim 1, and Banister discloses: wherein the modulation symbols of the sub-code are channel-interleaved symbols (Fig. 1, concatenation interleaver 14, is considered as the channel interleaver, since the coding that the outer coder performs is referred to as "channel coding", see column 4,lines 1-2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 5-6, 11-12, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banister (U.S. 6,876,641).

With respect to claim 5, Banister discloses: generating a plurality of sub-codes for the input of a PLP (Physical Layer Packet) information bit stream (see Fig. 1, plurality of sub-codes 12_1-12_N generated by the plurality of coding devices 12_1 –12_N with respect to the PLP input, the PLP layer is used in cdma for feedback information, and see column 1, lines 14-24, and column 2, lines 35-38, where the system of Banister is used to transmit feedback information (and the PLP layer is used to transmit such information)); determining a minimum data rate by which the number of the modulation symbols of the sub-code generated by a predetermined modulation method is equal to or greater than the number of transmittable modulation symbols for each time period (Fig. 1, element 20, "Rate Matching Symbol Decimation", see column 4, lines 17-22, the rate matching process determines the data rate that provides a number of symbols equal to the allowed number of symbols, i.e. the minimum data rate that results into a number of symbols that fit in the frame, where (encoded) symbols are generated from a modulation (interpreted as a variation of a property of an electrical signal) using either the optional inner coder or the outer coders); channel-interleaving the symbols of the sub-code generated at the minimum code rate (Fig. 1, element 14, concatenation interleaver, and see column 4, lines 1-10, where all the merged symbols are channel - interleaved (including those generated at the minimum code rate)); modulating the channel-interleaved symbols by the predetermined modulation method (Fig. 1, inner coder 16 performing a specific encoding operation (interpreted as modulation as mentioned above)) ; and pruning part of the modulation symbols of the sub-code so that the number of the

modulation symbols of the sub-code is equal to the number of transmittable modulation symbols for the time period, if the number of the modulation symbols of the sub-code is greater than the number of transmittable modulation symbols for the time period (see column 4, lines column 4, lines 17-20, pruning is interpreted as "removing" i.e. delete the symbols that do not fit in the frame (and clearly a frame corresponds to a time period), operation of element 20 shown in Fig. 1).

Banister does not expressly teach: a plurality of sub-codes with the same or different code rates.

Examiner asserts that: sub-codes (such as the outer codes of Fig. 1 generated by elements 12_1-12_N such as block or convolutional or repetition codes column 4, lines 2-5) have the same or different code rates (this is well known in the art and code rates are expressed k/n where for k bits in n are output, and n-k are redundant bits) and it would have been obvious to a person skilled in the art at the time of the invention to use a plurality of sub-codes with the same or different code rates –so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained. Therefore, it would have been obvious to a person skilled in the art at the time of the invention to modify the sub-codes of Banister (generated by blocks 121 –12N of Fig. 1) to have the same or different code rates, so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained.

With respect to claim 6, all of the limitations of claim 6, are analyzed above in claim 5, and Banister discloses: wherein symbol pruning is performed on a second half of the modulation symbols of the sub-code (see Fig. 2, 2nd sequence of symbols, showing symbols to be deleted ("X") and see that the pruning takes place on a second half of the modulation symbols, column 4, lines 35-54 details with respect to the pruning distance).

With respect to claim 11, Banister discloses: a sub-code generator for generating a plurality of sub-codes for the input of a PLP (Physical Layer Packet) information bit stream (see Fig. 1, see each one of the plurality of outer coders that generate any one of repetition, block or convolutional codes, see column 4, lines 2-5); a controller for determining a minimum data rate by which the number of the modulation symbols of a sub-code generated by a predetermined modulation method is equal to or greater than the number of transmittable modulation symbols for each time period (Fig. 1, element 20, "Rate Matching Symbol Decimation", see column 4, lines 17-22, the rate matching process determines the data rate that provides a number of symbols equal to the allowed number of symbols, i.e. the minimum data rate that results into a number of symbols that fit in the frame, where (encoded) symbols are generated from a modulation (interpreted as a variation of a property of an electrical signal) using either the optional inner coder or the outer coders); and a symbol pruner for pruning part of the modulation symbols of the sub-code so that the number of the modulation symbols of the sub-code is equal to the number of transmittable

modulation symbols for the time period, if the number of the modulation symbols of the sub-code is greater than the number of transmittable modulation symbols for the time period (see column 4, lines column 4, lines 17-20, pruning is interpreted as "removing" i.e. delete the symbols that do not fit in the frame (and clearly a frame corresponds to a time period), operation of element 20 shown in Fig. 1).

Banister does not expressly teach: a plurality of sub-codes with the same or different code rates.

Examiner asserts that: sub-codes (such as the outer codes of Fig. 1 generated by elements 12_1-12_N such as block or convolutional or repetition codes column 4, lines 2-5) have the same or different code rates (this is well known in the art and code rates are expressed k/n where for k bits in n are output, and n-k are redundant bits) and it would have been obvious to a person skilled in the art at the time of the invention to use a plurality of sub-codes with the same or different code rates –so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained. Therefore, it would have been obvious to a person skilled in the art at the time of the invention to modify the sub-codes of Banister (generated by blocks 121 –12N of Fig. 1) to have the same or different code rates, so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained.

With respect to claim 12, all of the limitations of claim 12, are analyzed above in claim 11, and Banister discloses: wherein the symbol pruner prunes

part of the second half of the modulation symbols of the sub-code (see Fig. 2, 2nd sequence of symbols, showing symbols to be deleted ("X") and see that the pruning takes place on a second half of the modulation symbols, column 4, lines 35-54 details with respect to the pruning distance).

With respect to claim 14, Banister discloses: a sub-code generator for generating a plurality of sub-codes for the input of a PLP (Physical Layer Packet) information bit stream (see Fig. 1, see each one of the plurality of outer coders that generate any one of repetition, block or convolutional codes, see column 4, lines 2-5); a controller for determining a minimum data rate by which the number of the modulation symbols of a sub-code generated by a predetermined modulation method is equal to or greater than the number of transmittable modulation symbols for a time period (Fig. 1, element 20, "Rate Matching Symbol Decimation", see column 4, lines 17-22, the rate matching process determines the data rate that provides a number of symbols equal to the allowed number of symbols, i.e. the minimum data rate that results into a number of symbols that fit in the frame, where (encoded) symbols are generated from a modulation (interpreted as a variation of a property of an electrical signal) using either the optional inner coder or the outer coders); a channel interleaver for channel-interleaving the symbols of the sub-code generated at the minimum code rate (Fig. 1, element 14, concatenation interleaver, and see column 4, lines 1-10, where all the merged symbols are channel - interleaved (including those generated at the minimum code rate)); ; a modulator for modulating the channel-

interleaved symbols by the predetermined modulation method; and a symbol pruner for pruning part of the modulation symbols of the sub-code so that the number of the modulation symbols of the sub-code is equal to the number of transmittable modulation symbols for the time period, if the number of the modulation symbols of the sub-code is greater than the number of transmittable modulation symbols for the time period.

Banister does not expressly teach: of sub-codes with the same or different code rates, and (the sub-code generator) sequentially transmitting the sub-codes for time periods.

Examiner asserts that: sub-codes (such as the outer codes of Fig. 1 generated by elements 12_1-12_N such as block or convolutional or repetition codes column 4, lines 2-5) have the same or different code rates (this is well known in the art and code rates are expressed k/n where for k bits in n are output, and n-k are redundant bits) and it would have been obvious to a person skilled in the art at the time of the invention to use a plurality of sub-codes with the same or different code rates –so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained. Therefore, it would have been obvious to a person skilled in the art at the time of the invention to modify the sub-codes of Banister (generated by each one of the blocks 121 –12N of Fig. 1) to have the same or different code rates, so that equal or unequal redundancy i.e. protection of the encoded data streams is obtained. With respect to the limitation, the sub-code generator sequentially transmitting the sub-codes for time periods, it would have been obvious to a person skilled in the art that in the system obtained by

modifying the outer encoders (to generate sub-codes with the same of different code rates) of Banister, the sub-code generator, sequentially transmits the sub-codes for time periods, so that input bits are encoded in a controlled manner (i.e a bit sequence is encoded with code 1, and once that encoding operation id performed, another bit sequence is encoded with either code 1 or code 2).

With respect to claim 15, all of the limitations of claim 15, are analyzed above in claim 14, and Banister discloses: wherein the symbol pruner prunes part of the second half of the modulation symbols of the sub-code ((see Fig. 2, 2nd sequence of symbols, showing symbols to be deleted ("X") and see that the pruning takes place on a second half of the modulation symbols, column 4, lines 35-54 details with respect to the pruning distance).

Allowable Subject Matter

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of the record fails to teach alone or in combination: determining a minimum data rate by which the number of the modulation symbols of a sub-code generated by a predetermined modulation method is equal to or greater than the number of transmittable modulation symbols for each time period; pruning part of the channel-interleaved symbols so that the number of the channel-interleaved symbols is equal to the number of transmittable modulation symbols, if the number of the channel-interleaved symbols is greater than the

number of transmittable modulation symbols; and modulating the remaining channel-interleaved symbols by the predetermined modulation method as reicted in claim 8 and in combination with other elements of the claim.

Claims 8-9 are allowed.

The prior art of the record fails to teach alone or in combination: a controller for determining a minimum data rate by which the number of the modulation symbols of a sub-code generated by a predetermined modulation method is equal to or greater than the number of transmittable modulation symbols for a time period; a symbol pruner for pruning part of the channel-interleaved symbols so that the number of the channel-interleaved symbols is equal to the number of transmittable modulation symbols, if the number of the channel-interleaved symbols is greater than the number of transmittable modulation symbols; and a modulator for modulating the remaining channel-interleaved symbols by the predetermined modulation method.

Claims 17-19 are allowed.

9. Claims 4, 7,13,and 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is 571 272 5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
12/28/06

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER